

Claims:

1. A cutting and edge-preparing apparatus, comprising:
  - a housing adapted to be mounted on a workpiece;
  - a faceplate mounted on a front surface of said housing and being rotatable relative to said housing;
  - at least one tool holder mounted on said faceplate for holding a tool;
  - a gearbox having first gearing for turning said faceplate and second gearing connected to a power transmission shaft for advancing and retracting said tool holder relative to the workpiece; and
  - a motor;
  - said first and second gearing each having a predetermined number of teeth, and said number of teeth of said first gearing being different from said number of teeth of said second gearing; and
  - said second gearing having a changeable combination of gears for changing the difference between said number of teeth of said first gearing for turning the faceplate and said number of teeth of said second gearing for turning said power transmission shaft;

whereby, turning direction and turning speed of said power transmission shaft relative to turning speed of said faceplate can be changed to permit said tool holder to be moved relative to the workpiece in rapid-feed, slow-feed, and rapid-return modes.

2. A cutting and edge-preparing apparatus according to claim 1, wherein an annular faceplate gear is attached to a rear surface of said faceplate and is engaged with said first gearing of said gearbox to rotate said faceplate relative to said housing; wherein said housing contains a speed-changing compound ring gear having two external gears with different diameters and a single internal gear; wherein said second gearing includes a feed gearing and a rapid-feed-and-return gearing, and said power transmission shaft is rotated by one of said feed gearing and said rapid-feed-and-return gearing; wherein each of said feed gearing and said rapid-feed-and-return gearing includes a compound gear that has a plurality of gears and two transmission gears that have different diameters and that are capable of being engaged with said compound gear; and wherein said number of teeth of said first gearing for rotating the faceplate and that of said second gearing for rotating the power transmission shaft are made to differ from each other by a combination of said plurality of gears of said compound gear and said transmission gears.

3. A cutting and edge-preparing apparatus according to claim 2, wherein said compound gears of said feed gearing and said rapid-feed-and-return gearing are shifted in axial directions by shift arms; wherein said shift arms are connected to levers by rods; wherein said levers extend externally of said gearbox; and wherein said combination of said plurality of gears of said compound gear and said transmission gears of said feed gearing and said combination of said plurality of gears of said compound gear and said transmission gears of said rapid-feed-and-return gearing are changed by operating said levers.

4. A cutting and edge-preparing apparatus according to claim 3, wherein a clutch is installed between said motor and said faceplate.
5. A cutting and edge-preparing apparatus according to claim 4, wherein said rods control lever movement such that said compound gear and said transmission gears of said feed gearing, and said compound gear and said transmission gears of said rapid-feed-and-return gearing are not simultaneously engaged.
6. A cutting and edge-preparing apparatus according to claim 1, wherein said second gearing includes a feed gearing and a rapid-feed-and-return gearing; wherein said power transmission shaft is rotated by one of said feed gearing and said rapid-feed-and-return gearing; wherein each of said feed gearing and said rapid-feed-and-return gearing includes a compound gear that has a plurality of gears and two transmission gears that have different diameters and that are capable of being engaged with said compound gear; wherein said compound gears of said feed gearing and said rapid-feed-and-return gearing are shiftable in axial directions by shift arms; wherein said shift arms are connected to levers by rods; wherein said levers extend externally of said gearbox; and wherein said combination of said plurality of gears of said compound gear and said transmission gears of said feed gearing and said combination of said plurality of gears of said compound gear and said transmission gears of said rapid-feed-and-return gearing are changed by operating said levers.

7. A cutting and edge-preparing apparatus according to claim 6, wherein said rods control lever movement such that said compound gear and said transmission gears of said feed gearing, and said compound gear and said transmission gears of said rapid-feed-and-return gearing are not simultaneously engaged.

8. A cutting and edge-preparing apparatus according to claim 1, wherein a clutch is installed between said motor and said faceplate.

9. A profile machining apparatus for preparing an edge of a pipe, said apparatus having a housing adapted to be mounted on a pipe, a faceplate mounted on a front surface of said housing and being rotatable relative to said housing, and a tool holder mounted on said faceplate for holding a tool, said tool holder comprising:

a carriage having one end holding the tool and an opposite end with a profiling roller;

a template having a contour that is engagable by said profiling roller;

and

a power transmission mechanism for receiving power from said faceplate and for advancing and retracting said carriage in an axial direction relative to the pipe;

said carriage being supported on said tool holder by a support shaft such that said carriage is permitted to swing about and around said support shaft; and

said profiling roller following said contour of said template when being advanced and retracted by said power transmission mechanism; whereby machining of the edge of the pipe is conducted according to said contour of said template.

10. A profile machining apparatus according to claim 9, further comprising a means for manually adjusting a position of said tool in a radial or axial direction of the pipe.

11. A profile machining apparatus according to claim 9, further comprising a manual feed apparatus for manually advancing or retracting said carriage relative to the pipe.

12. A profile machining apparatus according to claim 9, wherein said power transmission mechanism has a bevel gear used to receive power from said faceplate.

13. A profile machining apparatus for preparing an edge of a workpiece such as a pipe, said apparatus having a housing adapted to be mounted on the workpiece, a faceplate mounted on a front surface of said housing and being rotatable relative to said housing, and a tool holder mounted on said faceplate for holding a tool, said tool holder comprising:

    a carriage having one end holding the tool and having a profiling shaft;

    a template having a groove for receiving said profiling shaft; and

a power transmission mechanism for receiving power from said faceplate and for advancing and retracting said carriage relative to the workpiece;  
whereby said profiling shaft follows said groove as said carriage is advanced or retracted by said power transmission mechanism so that the tool supported on said carriage machines an edge of the workpiece according to a shape said groove.

14. A profile machining apparatus according to claim 13, further comprising a means for manually adjusting a position of said tool in a radial or axial direction of the workpiece.

15. A profile machining apparatus according to claim 13, further comprising a manual feed apparatus for manually advancing or retracting said carriage relative to the workpiece.

16. A profile machining apparatus according to claim 13, wherein said power transmission mechanism has a bevel gear used to receive power from said faceplate.